

Balancing Authority ACE Limit Proof-of-Concept Field Trial

Eastern Interconnection Update Discussion
July 26, 2010

Doug Hils – Duke Energy

Reliability-Based Control Standard Drafting Team

Balancing Authority ACE Limit Proof-of-Concept Field Trial

Eastern Interconnection Field Trial Participation

Participation reflects approximately 67% of the projected 2010 peak load for the Eastern Interconnection

Eastern Interconnection Balancing Authority Participants	2010 Frequency Bias	Region	Reliability Coordinator	Start Date
American Electric Power (CSWS)	-103.4	SPP	SPP	September 1, 2005
Associated Electric Cooperative, Inc. (AECI)	-45	SERC	TVA	April 1, 2010
Duke Energy Carolinas (DUK)	-196	SERC	VACS	April 1, 2009
East Kentucky Power Cooperative (EKPC)	-42.73	SERC	TVA	July 6, 2005
Entergy (EES)	-227.1	SERC	ICTE	July 6, 2005
EON-US (LGEE)	-74	SERC	TVA	April 1, 2008
Independent Electricity System Operator (IESO)	-245.8	NPCC	IESO	March 1, 2008
Manitoba Hydro (MHEB)	-43.3	MRO	MISO	July 6, 2005
Midwest Independent Transmission System Operator (MISO)	-1038.6	MRO, RFC, SERC	MISO	January 6, 2009
PJM Interconnection (PJM)	-1358	RFC	PJM	August 1, 2005
Santee Cooper (SC)	-61.52	SERC	VACS	March 1, 2006
Southern Company (SOCO)	-445	SERC	SOCO	October 15, 2005
Tennessee Valley Authority (TVA)	-317.6	SERC	TVA	October 1, 2005

Balancing Authority ACE Limit Proof-of-Concept Field Trial

The Balancing Authority ACE Limit (BAAL) shall not be exceeded for more than 30 consecutive clock-minutes*

	Longest exceedance of the Balancing Authority ACE Limit since starting operation under the Field Trial		June 2010 Performance under BAL-007	
	Max MinCtLow	Max MinCtHigh	Max MinCtLow	Max MinCtHigh
BA01	26	16	6	6
BA02	17	17	10	7
BA03	19	19	10	12
BA04	28	19	28	17
BA05	10	20	6	6
BA06	16	22	10	8
BA07	15	23	7	6
BA08	20	24	5	9
BA09	28	26	16	14
BA10	21	31	12	17
BA11	14	32	5	6
BA12	29	40	16	23
BA13	28	43	7	9

MinCtLow = Count of consecutive clock-minutes BAAL_Low was exceeded

MinCtHigh = Count of consecutive clock-minutes BAAL_High was exceeded

*BAAL being exceeded for more than 30 consecutive clock-minutes would be a violation under the proposed BAL-007 standard.

Frequency Statistics

Eastern Interconnection

Year	Month	Total Minutes FTL_Low at 59.98 Hz SF	Total Minutes FTL_Low at 60 Hz SF	Total FTL_Low Minutes	Percentage Low During TEC	FTL_Low Events	FTL_Low Max Duration	Total Minutes FTL_High at 60.02 Hz SF	Total Minutes FTL_High at 60 Hz SF	Total FTL_High Minutes	Percentage High During TEC	FTL_High Events	FTL_High Max Duration	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes
2005	7	28	30	58	48.28%	32	5	0	16	16	0.00%	11	3	46	74
2005	8	47	91	138	34.06%	56	10	0	35	35	0.00%	21	5	126	173
2005	9	32	39	71	45.07%	33	8	0	39	39	0.00%	21	7	78	110
2005	10	42	48	90	46.67%	43	11	0	33	33	0.00%	23	5	81	123
2005	11	65	43	108	60.19%	58	6	0	35	35	0.00%	22	7	78	143
2005	12	37	36	73	50.68%	41	7	0	27	27	0.00%	19	3	63	100
2006	1	42	33	75	56.00%	43	6	0	61	61	0.00%	27	5	94	136
2006	2	0	64	64	0.00%	39	6	2	43	45	4.44%	24	4	107	109
2006	3	28	51	79	35.44%	50	4	17	37	54	31.48%	33	8	88	133
2006	4	19	86	105	18.10%	58	5	0	76	76	0.00%	46	8	162	181
2006	5	52	67	119	43.70%	54	8	0	72	72	0.00%	39	5	139	191
2006	6	45	34	79	56.96%	41	5	0	59	59	0.00%	24	10	93	138
2006	7	31	40	71	43.66%	34	9	0	50	50	0.00%	29	4	90	121
2006	8	16	85	101	15.84%	49	5	0	58	58	0.00%	26	8	143	159
2006	9	19	60	79	24.05%	39	6	0	53	53	0.00%	33	4	113	132
2006	10	53	42	95	55.79%	51	6	0	54	54	0.00%	28	8	96	149
2006	11	56	35	91	61.54%	47	5	1	36	37	2.70%	22	3	71	128
2006	12	34	18	52	65.38%	34	4	0	54	54	0.00%	29	6	72	106
2007	1	59	29	88	67.05%	44	7	0	55	55	0.00%	31	7	84	143
2007	2	17	31	48	35.42%	33	3	0	39	39	0.00%	21	4	70	87
2007	3	75	83	158	47.47%	76	15	0	78	78	0.00%	38	8	161	236
2007	4	36	41	77	46.75%	45	5	0	58	58	0.00%	31	4	99	135
2007	5	70	46	116	60.34%	64	5	0	95	95	0.00%	49	7	141	211
2007	6	62	30	92	67.39%	47	6	0	51	51	0.00%	25	7	81	143
2007	7	47	20	67	70.15%	33	6	0	39	39	0.00%	20	4	59	106
2007	8	37	25	62	59.68%	31	6	1	55	56	1.79%	32	5	80	118
2007	9	20	75	95	21.05%	41	8	0	27	27	0.00%	16	5	102	122
2007	10	57	65	122	46.72%	73	5	1	56	57	1.75%	36	5	121	179
2007	11	74	21	95	77.89%	60	4	0	34	34	0.00%	24	5	55	129
2007	12	37	22	59	62.71%	38	6	0	61	61	0.00%	38	4	83	120
2008	1	0	75	75	0.00%	34	8	0	48	48	0.00%	24	4	123	123
2008	2	18	71	89	20.22%	46	8	0	51	51	0.00%	24	8	122	140
2008	3	37	65	102	36.27%	55	6	0	40	40	0.00%	34	2	105	142
2008	4	41	65	106	38.68%	60	5	0	59	59	0.00%	33	6	124	165
2008	5	67	39	106	63.21%	63	4	0	40	40	0.00%	20	5	79	146
2008	6	40	21	61	65.57%	34	5	0	35	35	0.00%	19	5	56	96
2008	7	42	17	59	71.19%	29	7	0	17	17	0.00%	12	3	34	76
2008	8	41	19	60	68.33%	35	5	0	29	29	0.00%	17	6	48	89
2008	9	25	44	69	36.23%	39	4	0	55	55	0.00%	21	11	99	124
2008	10	35	33	68	51.47%	38	5	0	27	27	0.00%	19	3	60	95
2008	11	13	9	22	59.09%	13	5	0	13	13	0.00%	9	4	22	35
2008	12	16	34	50	32.00%	35	4	0	11	11	0.00%	8	3	45	61
2009	1	2	26	28	7.14%	16	4	0	19	19	0.00%	9	3	45	47
2009	2	0	34	34	0.00%	18	4	0	18	18	0.00%	11	6	52	52
2009	3	0	41	41	0.00%	23	5	0	25	25	0.00%	11	9	66	66
2009	4	0	59	59	0.00%	37	5	0	27	27	0.00%	20	3	86	86
2009	5	8	35	43	18.60%	31	4	0	27	27	0.00%	15	8	62	70
2009	6	30	28	58	51.72%	28	5	0	25	25	0.00%	16	3	53	83
2009	7	14	22	36	38.89%	22	3	0	28	28	0.00%	16	6	50	64
2009	8	16	10	26	61.54%	20	2	0	13	13	0.00%	10	2	23	39
2009	9	11	22	33	33.33%	21	3	0	20	20	0.00%	14	4	42	53
2009	10	44	45	89	49.44%	44	6	0	18	18	0.00%	10	3	63	107
2009	11	30	19	49	61.22%	33	3	0	34	34	0.00%	21	4	53	83
2009	12	11	23	34	32.35%	20	5	0	22	22	0.00%	15	3	45	56
2010	1	36	26	62	58.06%	35	6	0	16	16	0.00%	9	3	42	78
2010	2	23	16	39	58.97%	24	3	0	26	26	0.00%	16	2	42	65
2010	3	38	71	109	34.86%	65	6	0	40	40	0.00%	22	6	111	149
2010	4	63	38	101	62.38%	65	5	0	54	54	0.00%	34	6	92	155
2010	5	72	30	102	70.59%	60	6	0	40	40	0.00%	29	4	70	142
2010	6	10	28	38	26.32%	27	2	0	10	10	0.00%	9	2	38	48

This chart is a summary of frequency-related statistics gathered since the start of the Field Trial. Of particular interest is the drop in operation outside of the FTL bounds, trending lower in the latter part of 2008 with November 2008 having the least number of clock-minutes of operation outside the FTL bounds, followed by August 2009, over the dataset.

Frequency Statistics

Eastern Interconnection

Year	Month	Total Minutes FTL_Low at 59.98 Hz SF	Total Minutes FTL_Low at 60 Hz SF	FTL_Minutes	Year	Month	Total Minutes FTL_Low at 59.98 Hz SF	Total Minutes FTL_Low at 60 Hz SF	Total FTL_Low Minutes	Percentage Low During TEC	FTL_Low Events	FTL_Low Max Duration	FTL_High Events	FTL_High Max Duration	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes
2006	7	28	30										11	3	48	74
2006	8	47	91										21	6	125	173
2006	9	32	39		2007	1	59	29	88	67.05%	44	7	21	7	78	118
2006	10	42	48		2007	2	17	31	48	35.42%	33	3	23	4	81	123
2006	11	65	43		2007	3	75	83	158	47.47%	76	15	22	7	78	143
2006	12	37	38		2007	4	36	41	77	46.75%	45	5	19	3	53	100
2006	1	42	33		2007	5	70	46	116	60.34%	64	5	27	6	94	138
2006	2	0	64		2007	6	62	30	92	67.39%	47	6	24	4	107	109
2006	3	28	61		2007	7	47	20	67	70.15%	33	6	33	8	68	133
2006	4	19	88		2007	8	37	25	62	59.68%	31	6	45	6	152	181
2006	5	62	67		2007	9	20	75	95	21.05%	41	8	39	6	139	191
2006	6	52	34		2007	10	57	65	122	46.72%	73	5	24	10	93	138
2006	7	45	40		2007	11	74	21	95	77.89%	60	4	29	4	90	121
2006	8	31	88		2007	12	37	22	59	62.71%	38	6	25	6	72	108
2006	9	15	60		2008	1	0	75	75	0.00%	34	8	31	7	84	143
2006	10	19	42		2008	2	18	71	89	20.22%	46	8	21	4	70	87
2006	11	65	38		2008	3	37	65	102	36.27%	55	6	38	4	151	238
2006	12	34	18		2008	4	41	65	106	38.68%	60	5	31	4	95	138
2007	1	69	29		2008	5	67	39	106	63.21%	63	4	49	7	141	211
2007	2	17	31		2008	6	40	21	61	65.57%	34	5	28	7	81	143
2007	3	75	83		2008	7	42	17	59	71.19%	29	7	20	4	89	108
2007	4	38	41		2008	8	41	19	60	68.33%	35	5	32	6	80	118
2007	5	70	48		2008	9	25	44	69	36.23%	39	4	18	6	102	122
2007	6	62	30		2008	10	35	33	68	51.47%	38	5	16	6	121	179
2007	7	47	20		2008	11	13	9	22	59.09%	13	5	35	3	55	129
2007	8	37	25		2008	12	16	34	50	32.00%	35	4	24	4	83	120
2007	9	20	75		2009	1	2	26	28	7.14%	16	4	38	4	123	123
2007	10	62	30		2009	2	0	34	34	0.00%	18	4	24	4	122	140
2007	11	47	20		2009	3	0	41	41	0.00%	23	5	24	4	108	145
2007	12	37	22		2009	4	0	59	59	0.00%	37	5	34	3	124	188
2008	1	0	75		2009	5	8	35	43	18.60%	31	4	33	2	79	148
2008	2	18	71		2009	6	30	28	58	51.72%	28	5	20	11	99	124
2008	3	37	65		2009	7	14	22	36	38.89%	22	3	19	4	60	98
2008	4	41	65		2009	8	16	10	26	61.54%	20	2	9	3	22	35
2008	5	67	39		2009	9	11	22	33	33.33%	21	3	8	3	48	81
2008	6	40	21		2009	10	44	45	89	49.44%	44	6	9	3	48	47
2008	7	42	17		2009	11	30	19	49	61.22%	33	3	11	3	52	83
2008	8	41	19		2009	12	11	23	34	32.35%	20	5	11	3	52	83
2008	9	25	44		2010	1	36	26	62	58.06%	35	6	11	3	56	88
2008	10	35	33		2010	2	23	16	39	58.97%	24	3	20	3	48	88
2008	11	13	9		2010	3	38	71	109	34.86%	65	6	15	3	42	78
2008	12	16	34		2010	4	63	38	101	62.38%	65	5	9	3	42	88
2009	1	2	26		2010	5	72	30	102	70.59%	60	6	22	3	111	149
2009	2	0	34		2010	6	10	28	38	26.32%	27	2	34	3	92	158
2009	3	0	41										29	3	70	142
2009	4	0	59										9	3	38	88
2009	5	8	35										15	3	42	88
2009	6	30	28										22	3	42	88
2009	7	14	22										10	3	42	88
2009	8	16	10										14	3	42	88
2009	9	11	22										10	3	42	88
2009	10	44	45										14	3	42	88
2009	11	30	19										10	3	42	88
2009	12	11	23										14	3	42	88
2010	1	36	26										10	3	42	88
2010	2	23	16										14	3	42	88
2010	3	38	71										10	3	42	88
2010	4	63	38										14	3	42	88
2010	5	72	30										10	3	42	88
2010	6	10	28										14	3	42	88

This chart is a summary of frequency-related statistics gathered since the start of the Field Trial. Of particular interest is the drop in operation outside of the FTL bounds, trending lower in the latter part of 2008 with November 2008 having the least number of clock-minutes of operation outside the FTL bounds, followed by August 2009, over the dataset.

Frequency Statistics

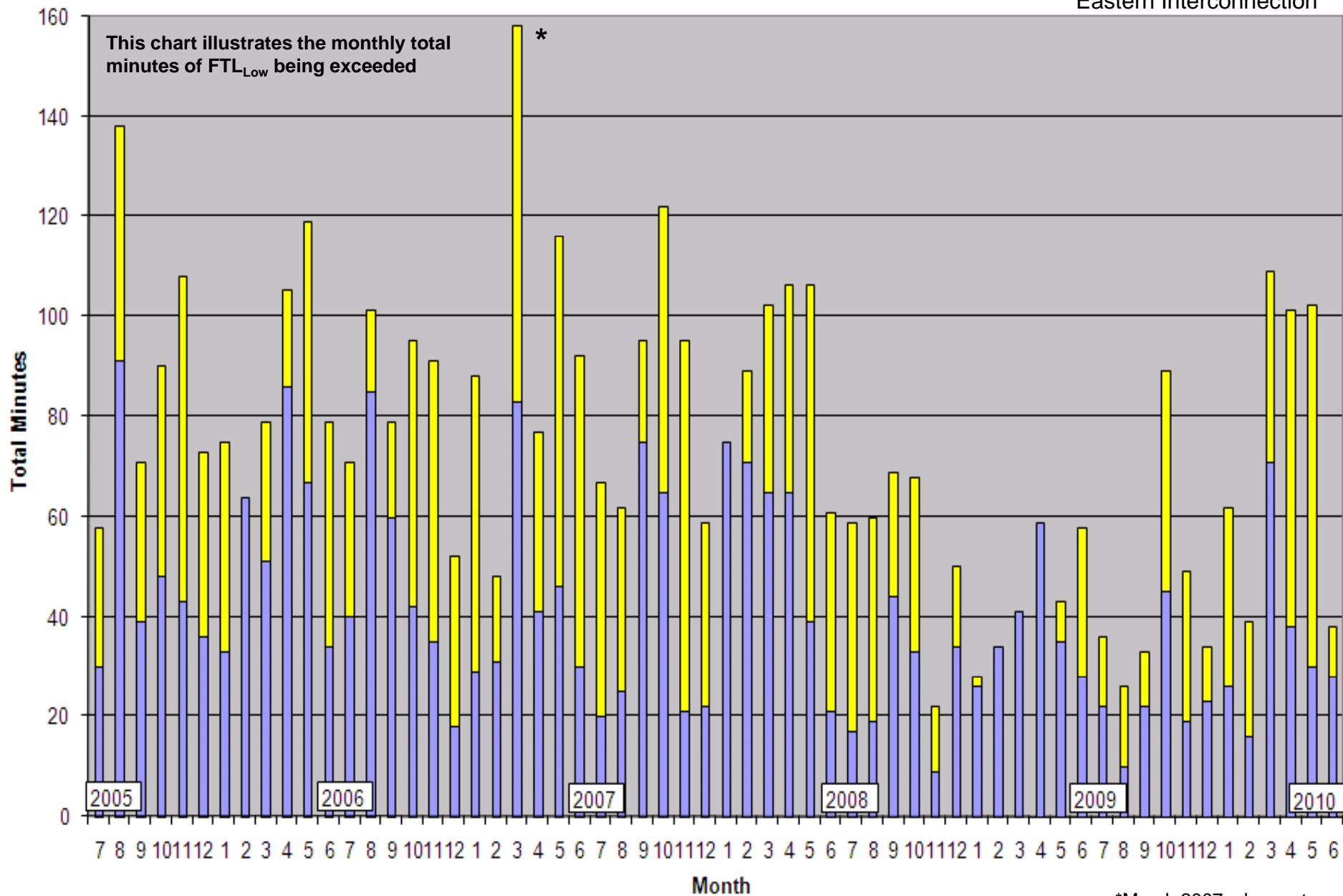
Eastern Interconnection

Year	Month	Total Minutes FTL_Low at 60 Hz SF	Total Minutes FTL_High at 60 Hz SF	Total Minutes FTL_High at 60 Hz SF	Total Minutes FTL_High at 60 Hz SF	Total FTL_High Minutes	Percentage High During TEC	FTL_High Events	FTL_High Max Duration	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes
2006	7	28										48	74
2006	8	47										125	173
2006	9	32										78	118
2006	10	42										81	123
2006	11	65										78	143
2006	12	37										53	100
2007	1	42										54	138
2007	2	0										107	109
2007	3	28										68	133
2007	4	19										152	181
2007	5	62										135	191
2007	6	45										93	138
2007	7	31										90	121
2007	8	15										143	159
2007	9	19										113	132
2007	10	63										98	149
2007	11	55										71	128
2007	12	34										72	108
2007	1	69										84	143
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2007	3	75										151	238
2007	4	38										95	138
2007	5	70										141	211
2007	6	62										81	143
2007	7	47										85	105
2007	8	37										80	118
2007	9	20										102	122
2007	10	57										121	179
2007	11	74										85	129
2007	12	37										83	89
2008	1	0										123	124
2008	2	18										122	140
2008	3	37										108	145
2008	4	41										124	155
2008	5	67										79	149
2008	6	40										55	98
2008	7	42										34	78
2008	8	41										48	89
2008	9	25										99	124
2008	10	37										60	95
2008	11	13										108	145
2008	12	41										124	155
2009	1	67										79	149
2009	2	40										55	98
2009	3	42										34	78
2009	4	41										48	89
2009	5	25										99	124
2009	6	29										80	118
2009	7	35										102	122
2009	8	20										121	179
2009	9	57										85	129
2009	10	74										83	89
2009	11	37										123	123
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2010	1	2										108	145
2010	2	0										124	155
2010	3	0										79	149
2010	4	0										55	98
2010	5	0										34	78
2010	6	0										48	89
2010	7	0										99	124
2010	8	0										60	95
2010	9	0										108	145
2010	10	0										124	155
2010	11	0										79	149
2010	12	0										55	98
2011	1	0										34	78
2011	2	0										48	89
2011	3	0										123	123
2011	4	0										122	140
2011	5	0										108	145
2011	6	0										124	155
2011	7	0										79	149
2011	8	0										55	98
2011	9	0										34	78
2011	10	0										48	89
2011	11	0										123	123
2011	12	0										122	140
2012	1	0										108	145
2012	2	0										124	155
2012	3	0										79	149
2012	4	0										55	98
2012	5	0										34	78
2012	6	0										48	89
2012	7	0										123	123
2012	8	0										122	140
2012	9	0										108	145
2012	10	0										124	155
2012	11	0										79	149
2012	12	0										55	98

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Total Minutes Exceeding Low FTL

Eastern Interconnection

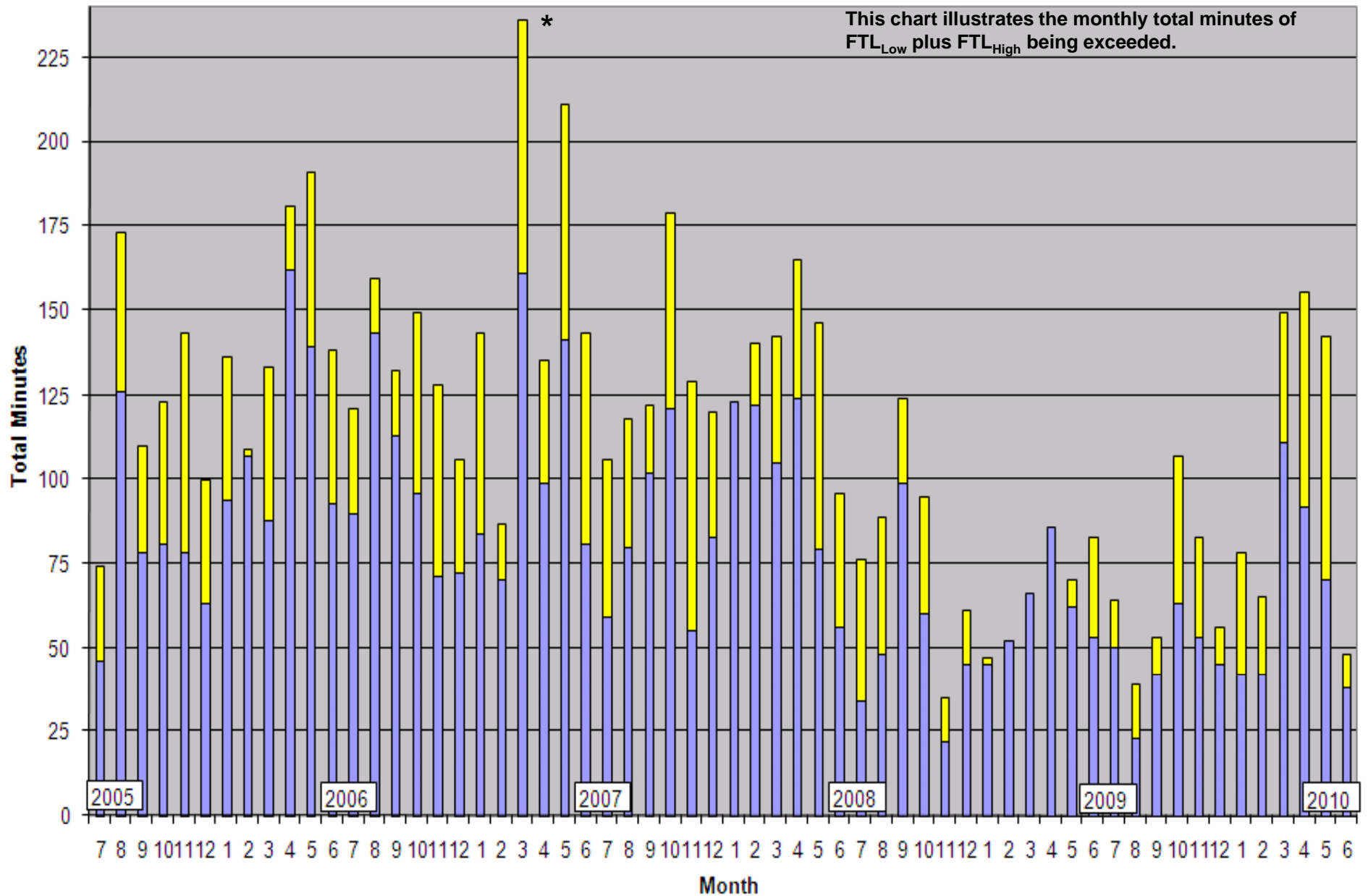


■ Total Minutes at 60 Hz
 ■ Addition Minutes During Time-Error Corrections

*March 2007- change to the new Daylight Saving Time.

Total Clock-Minutes less than Low FTL or greater than High FTL

Eastern Interconnection



*March 2007- change to the new Daylight Saving Time.

■ Total Minutes at 60 Hz ■ Addition Minutes During Time-Error Corrections

DateTime_EDT	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	DateTimeGMT_shift
6/1/10 7:13	60.0328	60	0	16	6/1/10 11:13
6/1/10 7:14	60.0176	60	0	17	6/1/10 11:14
6/2/10 2:14	60.0265	60	0	16	6/2/10 6:14
6/2/10 2:15	60.0319	60	0	17	6/2/10 6:15
6/1/10 7:13	60.0303	60	0	16	6/1/10 11:13
6/1/10 7:14	60.0145	60	0	17	6/1/10 11:14
6/10/10 14:21	59.9738	60	16	0	6/10/10 18:21
6/10/10 14:22	59.9756	60	17	0	6/10/10 18:22
6/10/10 14:23	59.9815	60	18	0	6/10/10 18:23
6/11/10 17:26	59.9686	59.98	16	0	6/11/10 21:26
6/11/10 17:27	59.9669	59.98	17	0	6/11/10 21:27
6/11/10 17:28	59.9723	59.98	18	0	6/11/10 21:28
6/11/10 17:29	59.9677	59.98	19	0	6/11/10 21:29
6/14/10 13:29	59.9797	60	16	0	6/14/10 17:29
6/14/10 13:30	59.9743	60	17	0	6/14/10 17:30
6/14/10 13:31	59.9777	60	18	0	6/14/10 17:31
6/14/10 13:32	59.9700	60	19	0	6/14/10 17:32
6/14/10 13:33	59.9641	60	20	0	6/14/10 17:33
6/14/10 13:34	59.9706	60	21	0	6/14/10 17:34
6/14/10 13:35	59.9690	60	22	0	6/14/10 17:35
6/14/10 13:36	59.9697	60	23	0	6/14/10 17:36
6/14/10 13:37	59.9778	60	24	0	6/14/10 17:37
6/14/10 13:38	59.9788	60	25	0	6/14/10 17:38
6/14/10 13:39	59.9802	60	26	0	6/14/10 17:39
6/14/10 13:40	59.9772	60	27	0	6/14/10 17:40
6/14/10 13:41	59.9717	60	28	0	6/14/10 17:41
6/16/10 14:48	59.9806	59.98	16	0	6/16/10 18:48
6/16/10 14:49	59.9811	59.98	17	0	6/16/10 18:49
6/16/10 14:50	59.9796	59.98	18	0	6/16/10 18:50
6/16/10 14:51	59.9803	59.98	19	0	6/16/10 18:51
6/16/10 14:52	59.9743	59.98	20	0	6/16/10 18:52
6/16/10 14:53	59.9796	59.98	21	0	6/16/10 18:53
6/16/10 14:54	59.9808	59.98	22	0	6/16/10 18:54
6/16/10 13:57	59.9852	59.98	16	0	6/16/10 17:57
6/18/10 3:25	60.0322	60	0	16	6/18/10 7:25
6/18/10 3:26	60.0240	60	0	17	6/18/10 7:26
6/18/10 17:06	60.0328	60	0	16	6/18/10 21:06
6/18/10 17:07	60.0230	60	0	17	6/18/10 21:07
6/20/10 6:32	60.0154	60	0	16	6/20/10 10:32
6/20/10 6:33	60.0238	60	0	17	6/20/10 10:33
6/20/10 6:34	60.0171	60	0	18	6/20/10 10:34
6/20/10 6:35	60.0190	60	0	19	6/20/10 10:35
6/20/10 6:36	60.0177	60	0	20	6/20/10 10:36
6/20/10 6:37	60.0250	60	0	21	6/20/10 10:37
6/20/10 6:38	60.0250	60	0	22	6/20/10 10:38
6/20/10 6:39	60.0188	60	0	23	6/20/10 10:39
6/21/10 12:43	59.9860	60	16	0	6/21/10 16:43

Periods of the BAAL being exceeded for more than 15 consecutive clock-minutes noted on left.

DateTime_EDT	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	DateTimeGMT_shift
6/1/10 7:13	60.0328	60	0	16	6/1/10 11:13
6/1/10 7:14	60.0176	60	0	17	6/1/10 11:14
6/2/10 2:14	60.0265	60	0	16	6/2/10 6:14
6/2/10 2:15	60.0319	60	0	17	6/2/10 6:15
6/1/10 7:13	60.0303	60	0	16	6/1/10 11:13
6/1/10 7:14	60.0145	60	0	17	6/1/10 11:14
6/10/10 14:21	59.9738	60	16	0	6/10/10 18:21
6/10/10 14:22	59.9756	60	17	0	6/10/10 18:22
6/10/10 14:23	59.9815	60	18	0	6/10/10 18:23
6/11/10 17:26	59.9686	59.98	16	0	6/11/10 21:26
6/11/10 17:27	59.9669	59.98	17	0	6/11/10 21:27
6/11/10 17:28	59.9723	59.98	18	0	6/11/10 21:28
6/11/10 17:29	59.9677	59.98	19	0	6/11/10 21:29

Periods of the BAAL being exceeded for more than 15 consecutive clock-minutes noted on left.

6/14/10 13:2
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:3
6/14/10 13:4
6/14/10 13:4
6/16/10 14:4
6/16/10 14:4
6/16/10 14:5
6/16/10 14:5
6/16/10 14:5
6/16/10 14:5
6/16/10 14:5
6/16/10 13:5
6/18/10 3:2
6/18/10 3:2

Dates in this presentation:

Clock-minute ACE less than the $BAAL_{Low}$ on June 14, 2010, ending 13:41 EDT: 28 consecutive clock-minutes

Clock-minute ACE less than the $BAAL_{Low}$ on June 16, 2010, ending 14:54 EDT: 22 consecutive clock-minutes, 59.98 Hz Scheduled Freq.

Clock-minute ACE greater than the $BAAL_{High}$ on June 20, 2010, ending 6:39 EDT: 23 consecutive clock-minutes

Under draft BAL-007, a proposed $BAAL_{Low}$ violation would occur when the ACE is lower than $BAAL_{Low}$ for more than 30 consecutive clock-minutes and a proposed $BAAL_{High}$ violation would occur when the ACE is greater than $BAAL_{High}$ for more than 30 consecutive clock-minutes.

6/18/10 17:06	60.0328	60	0	16	6/18/10 21:06
6/18/10 17:07	60.0230	60	0	17	6/18/10 21:07
6/20/10 6:32	60.0154	60	0	16	6/20/10 10:32
6/20/10 6:33	60.0238	60	0	17	6/20/10 10:33
6/20/10 6:34	60.0171	60	0	18	6/20/10 10:34
6/20/10 6:35	60.0190	60	0	19	6/20/10 10:35
6/20/10 6:36	60.0177	60	0	20	6/20/10 10:36
6/20/10 6:37	60.0250	60	0	21	6/20/10 10:37
6/20/10 6:38	60.0250	60	0	22	6/20/10 10:38
6/20/10 6:39	60.0188	60	0	23	6/20/10 10:39
6/21/10 12:43	59.9860	60	16	0	6/21/10 16:43

6/14/2010 ending 13:41 EDT
28-minute duration below BAAL_{Low}

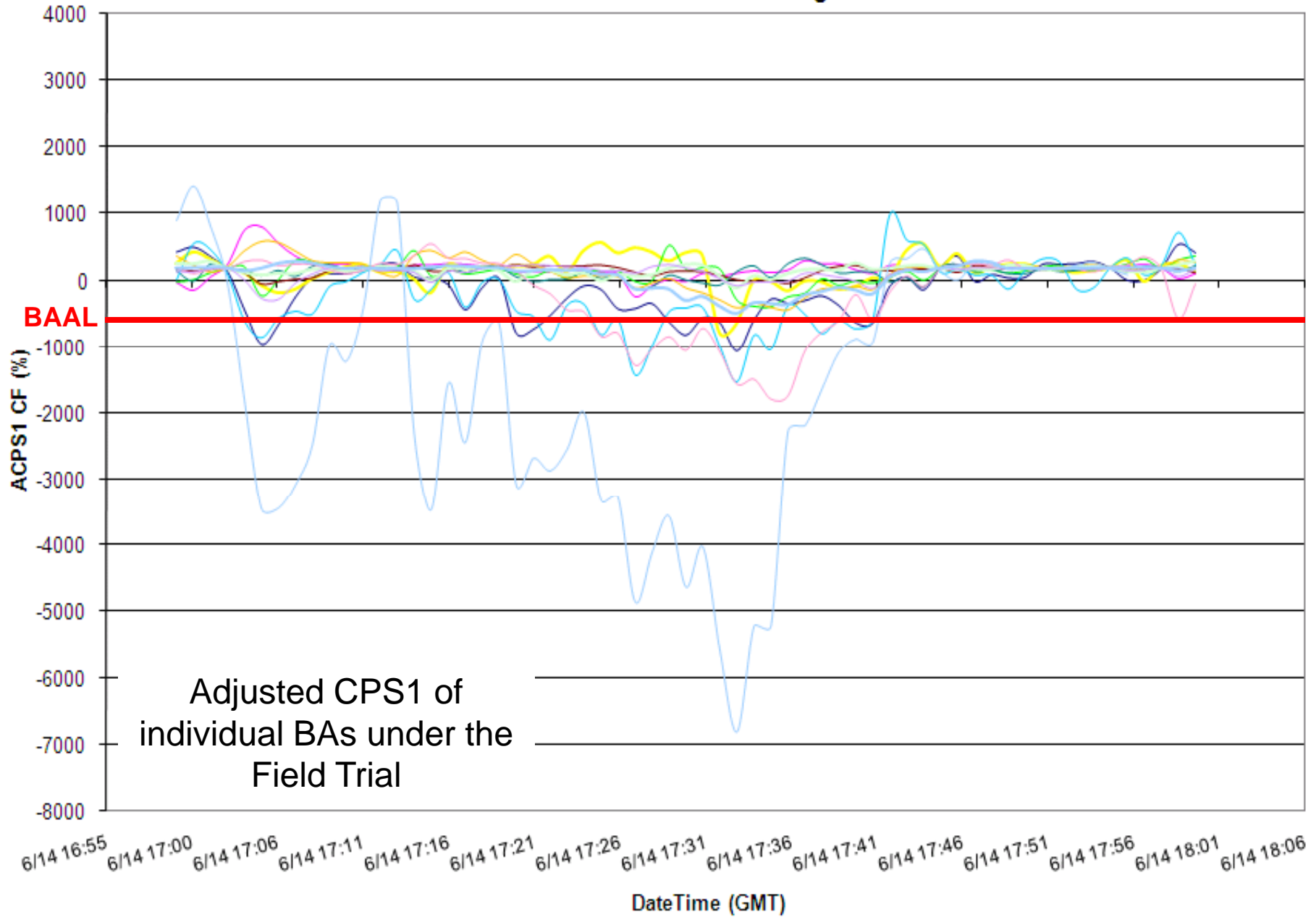
EI Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

6/14/2010 ending 13:41 EDT
28-minute duration below BAAL_{Low}

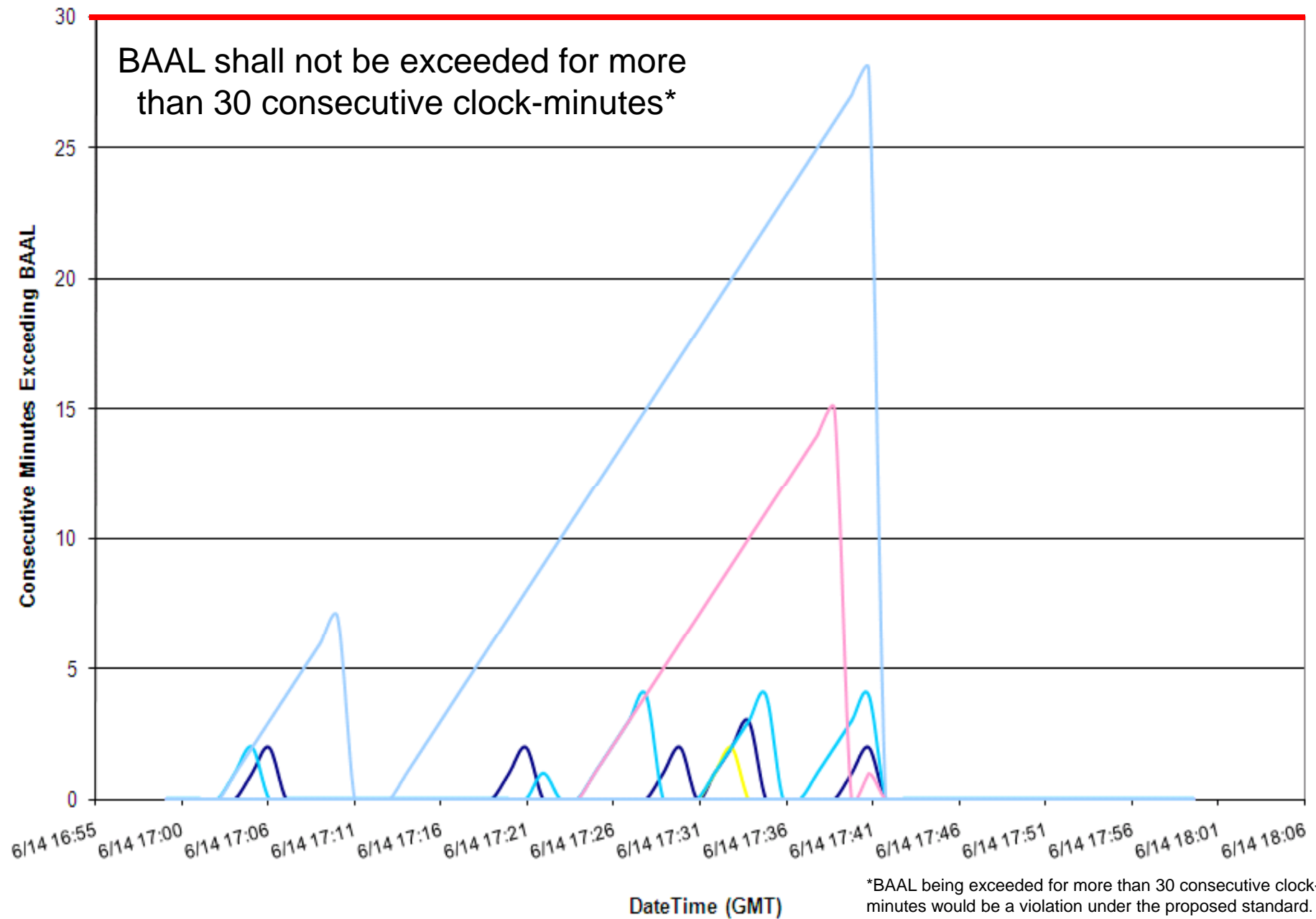
ACPS1 Clock-Minute Averages



6/14/2010 ending 13:41 EDT
28-minute duration below BAAL_{Low}

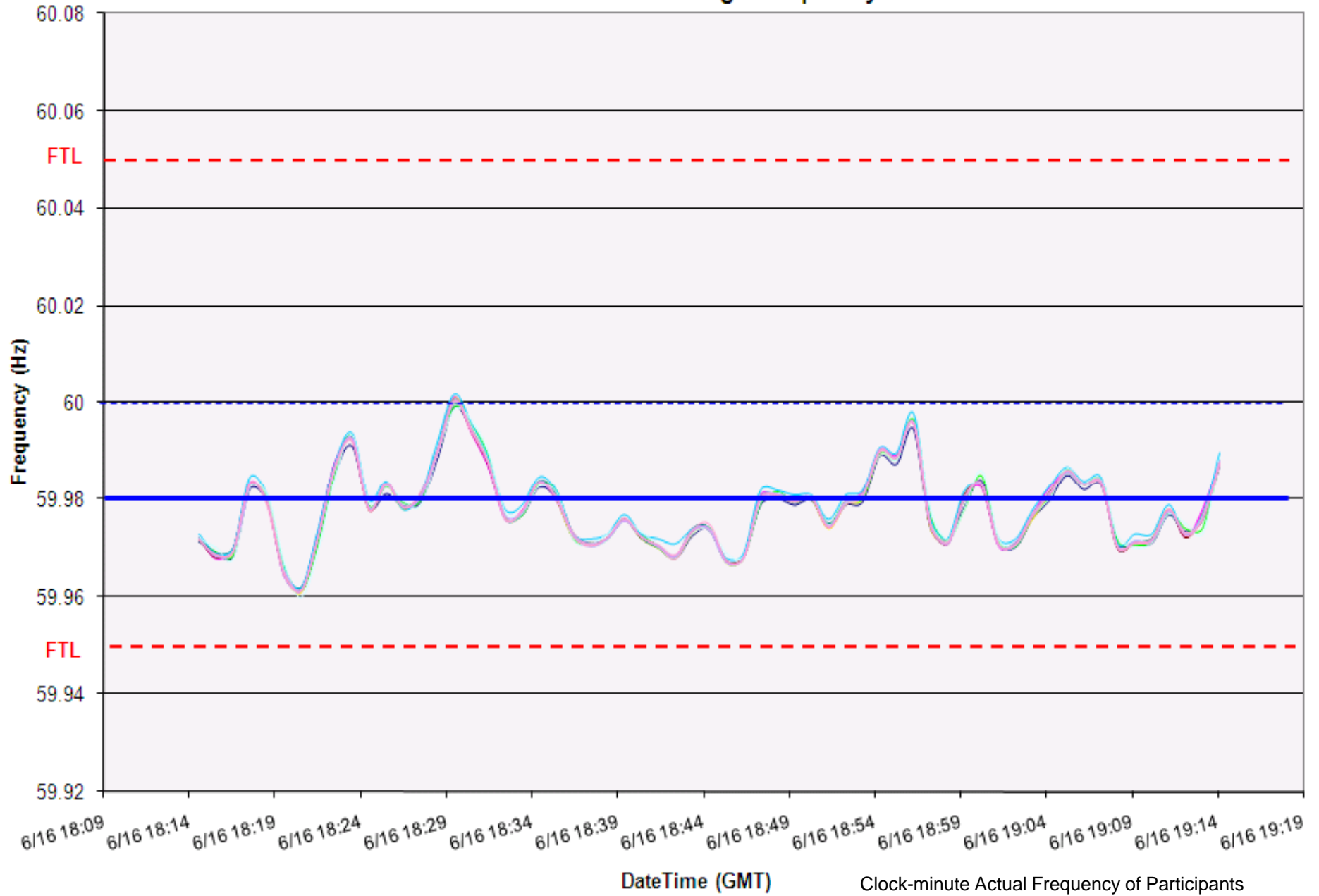
Consecutive Minutes Exceeding BAAL

BAAL Violation*



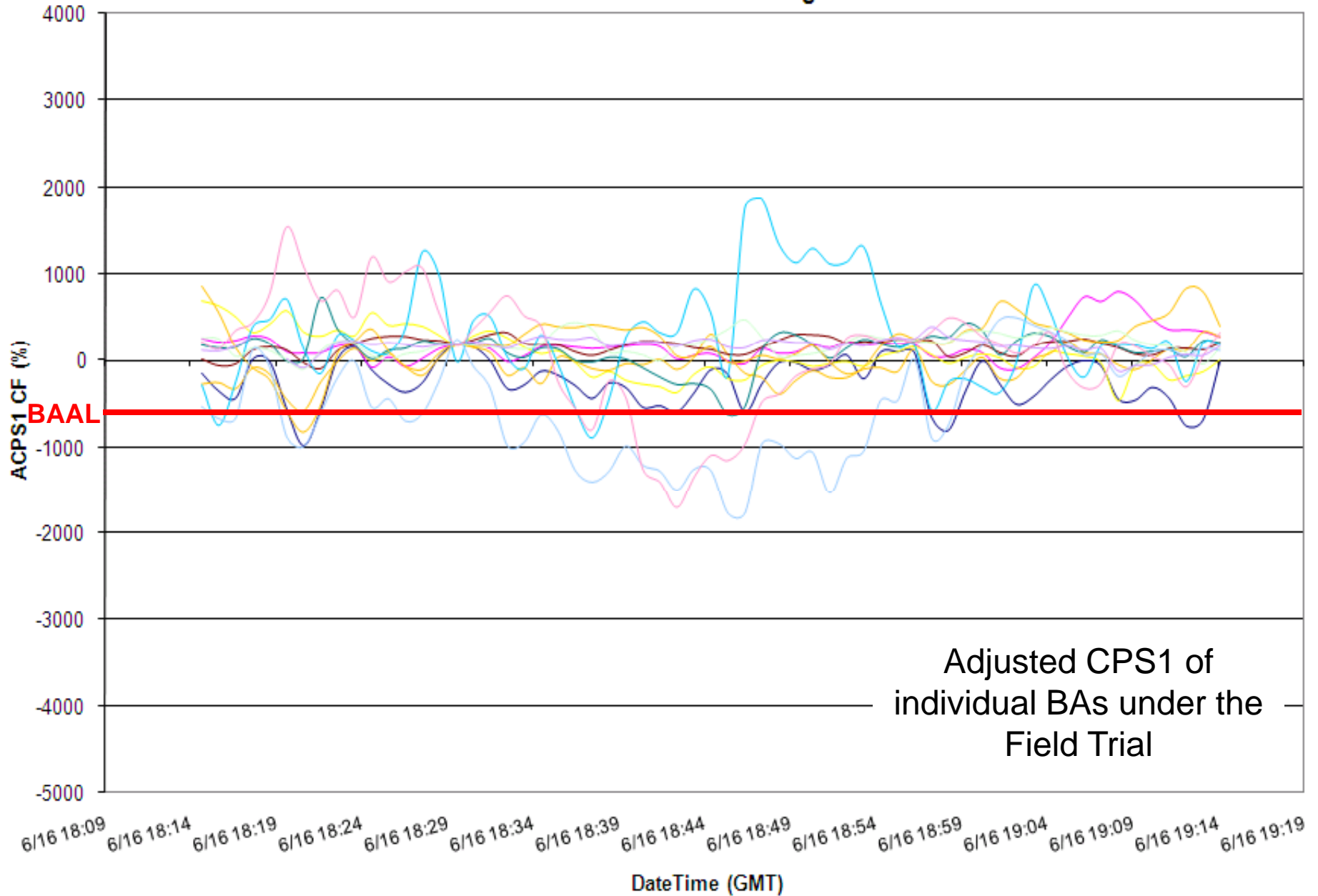
6/16/2010 ending 14:54 EDT
22-minute duration below BAAL_{Low}

EI Clock-Minute Average Frequency



6/16/2010 ending 14:54 EDT
22-minute duration below BAAL_{Low}

ACPS1 Clock-Minute Averages

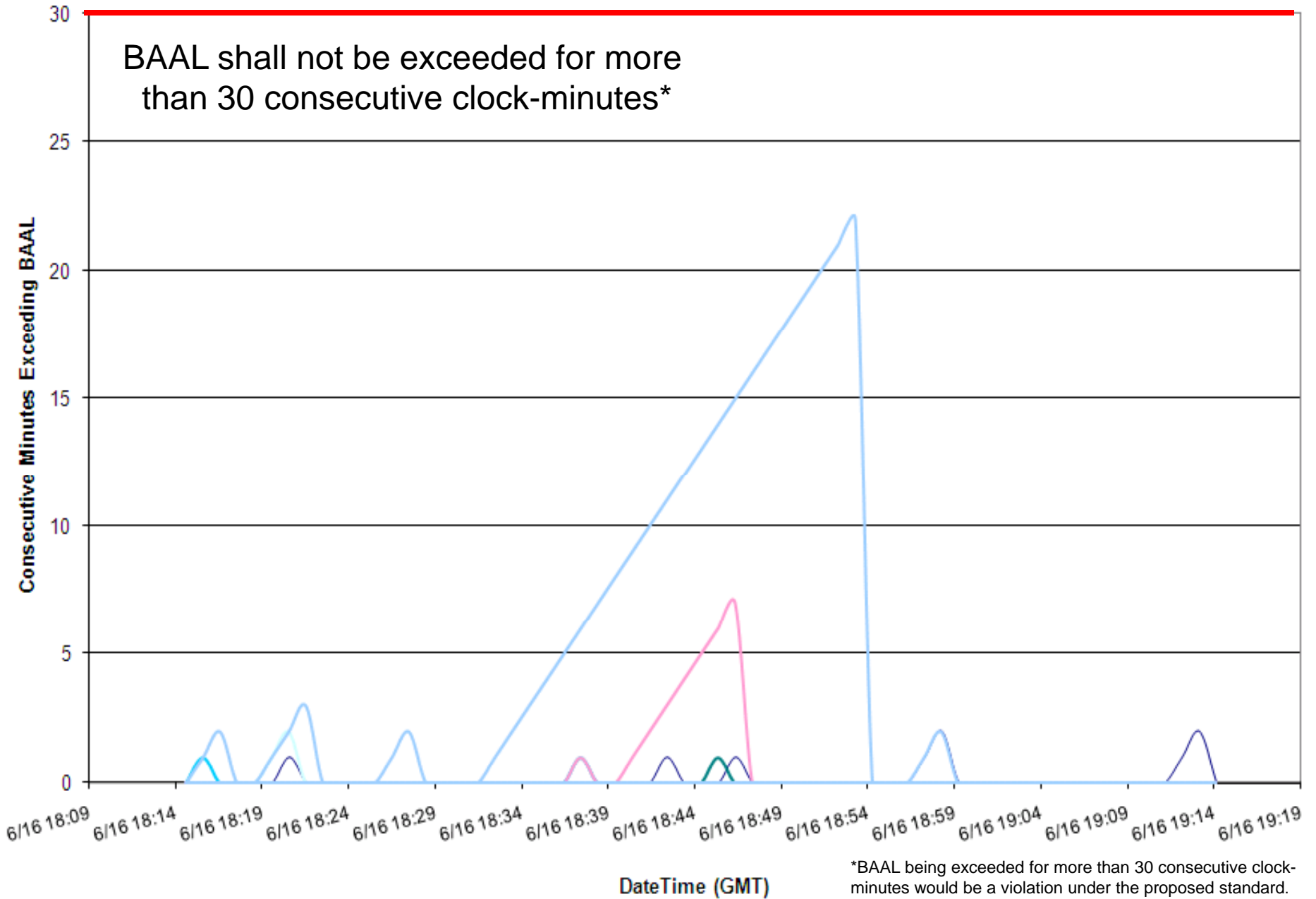


Adjusted CPS1 of
individual BAs under the
Field Trial

6/16/2010 ending 14:54 EDT
22-minute duration below BAAL_{Low}

Consecutive Minutes Exceeding BAAL

BAAL Violation*



6/20/2010 ending 6:39 EDT
23-minute duration above BAAL_{High}

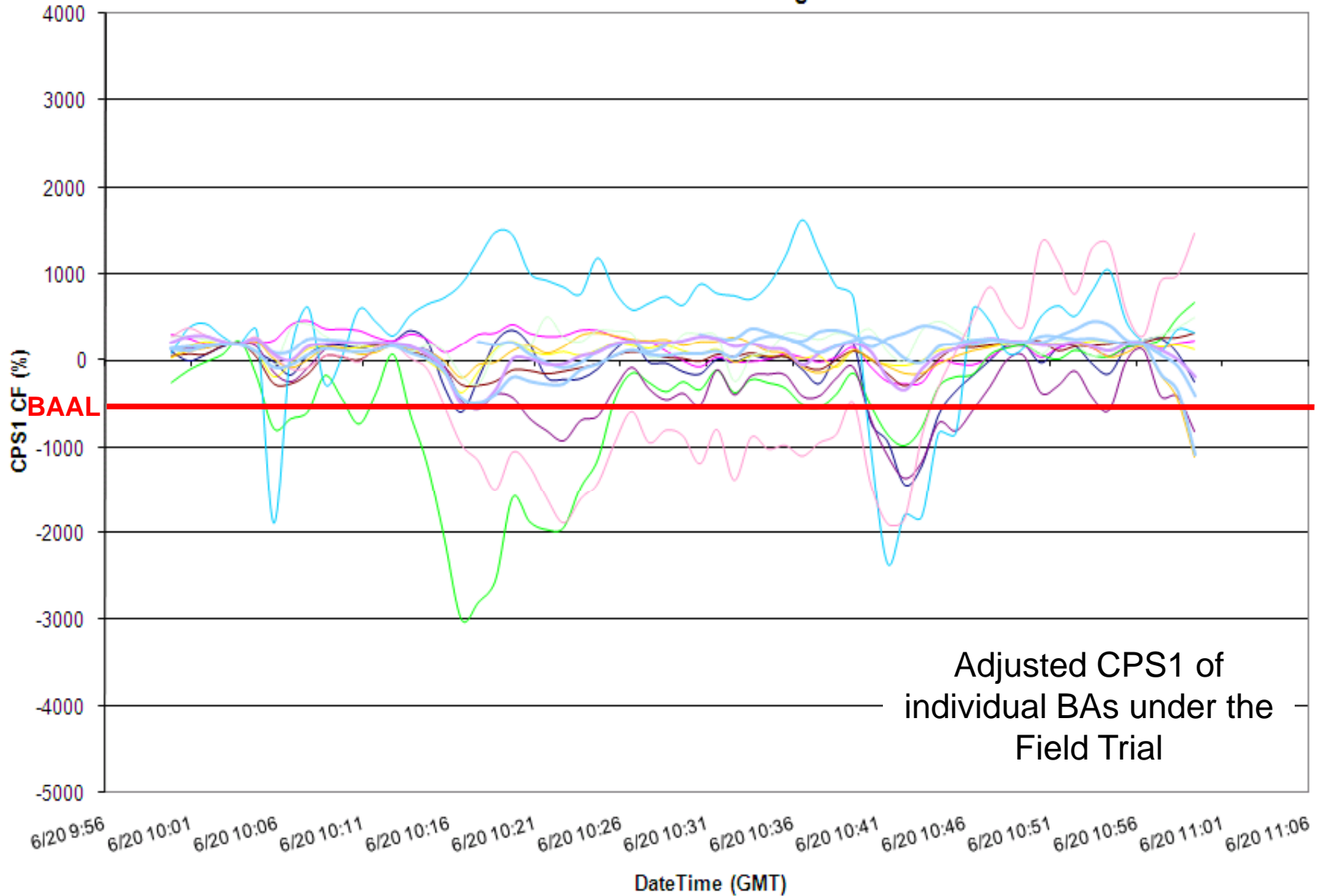
EI Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

6/20/2010 ending 6:39 EDT
23-minute duration above BAAL_{High}

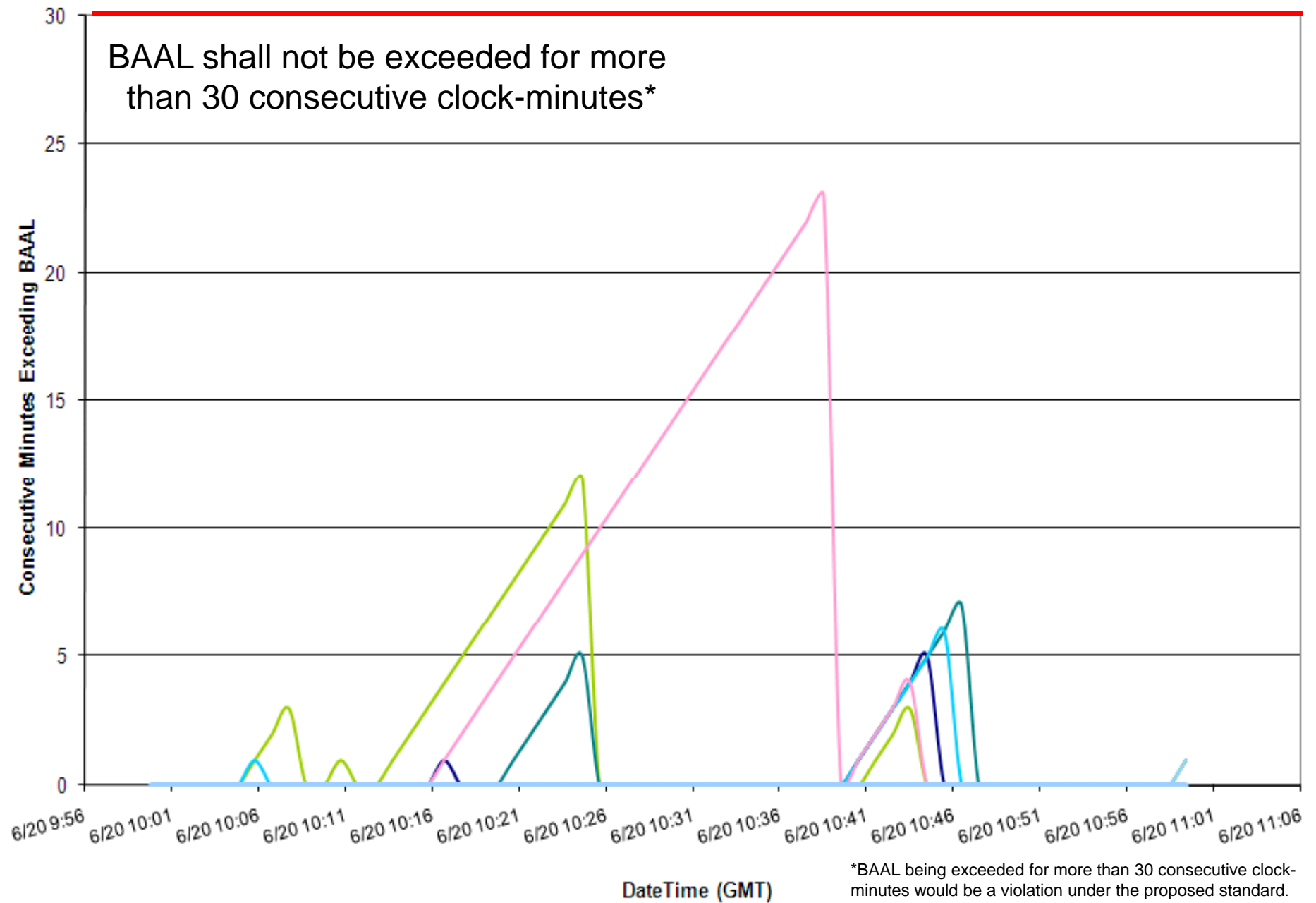
ACPS1 One-Minute Averages



6/20/2010 ending 6:39 EDT
23-minute duration above BAAL_{High}

Consecutive Minutes Exceeding BAAL

BAAL Violation*



Balancing Authority ACE Limit Proof-of-Concept Field Trial

Examples of circumstances when BAAL was exceeded and actions taken if appropriate

Clock-minute of ACE exceeding the BAAL (mm/dd/yy hh:mm)	Clock-minute of ACE returning within the BAAL (mm/dd/yy hh:mm)	TimeZone	Total duration of ACE exceeding the BAAL (minutes)	Event associated with a DCS-Reportable Event? (0=No, 1=Yes)	Event associated with a resource loss other than a DCS-Reportable Event? (0=No, 1=Yes)	Brief explanation of circumstances and notable actions taken if applicable
6/1/10 6:57	6/1/10 7:14	EPT	0:17	0	0	Generation ahead of ramp due to schedule starting late
6/2/10 1:58	6/2/10 2:15	EPT	0:17	0	0	Generation behind load
6/14/10 12:13	6/14/10 12:41	CDT	0:28	0	0	ACE was about -50 MW going into the schedule change for HE13, which was + 151 MW. At 11:38, chillers were started on a large combined cycle unit for about 25 MW increase. At 11:39, a 280 MW coal unit that had been reduced for coal conservation was raised back up 60 MW. At 12:25, a 110 MW peaker was started. At 12:33, a second 110 MW peaker was started. A 200 MW sale was curtailed to 100 MW at 12:35. Remainder of that sale was curtailed at 12:40.
6/16/10 13:32	6/16/10 13:54	CDT	0:22	0	0	Time error correction in effect. The load forecast for HE 14 was missed, and 150 MW of load was added during the hour. Prior to 13:00, a 48 MW sale was curtailed to 0. Schedules were changed to have a net schedule change of -200 MW for HE 15:00.
6/20/10 5:17	6/20/10 5:40	EST	0:23	0	0	The load dropped below 2500 MW. Recovery was impacted by a lack of sales and a low load.
6/21/10 11:27	6/21/10 11:43	EST	0:16	0	0	Generation was unable to keep up with the steel load, operator started a combustion turbine in order to bring ACE back within compliance.

Balancing Authority ACE Limit Proof-of-Concept Field Trial

Discussion

Doug Hils

Reliability-Based Control Standard Drafting Team

Doug.Hils@duke-energy.com